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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/734,154	12/11/2000	Adwait Ratnaparkhi	YOR9-2000-0468US1 (8728-4)	4210
22150	7590	05/05/2005	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			SHORTLEDGE, THOMAS E	
			ART UNIT	PAPER NUMBER

2654

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/734,154

Applicant(s)

RATNAPARKHI, ADWAIT

Examiner

Thomas E Shortledge

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments in the Amendment, filed November 12, 2004 with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7, 9-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van De Veen (5,943,643) in view of Dale et al. "Building Applied Natural Language Generation Systems" (EACL-99) and in further view of Langkilde et al. (Generation that Exploits Corpus-Based Statistical Knowledge).

As to claim 1, Van De Veen does teach:

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computer-based method of generating natural language (apparatus comprises a computer system, col. 2, lines 27-29);

receiving a concept comprising attributes and corresponding values of each of said attributes from a user (input that is dependent of the relationships and links between each and also the ambiguities between each, col. 2, lines 55-58);

receiving grammar rules from the user (input language lexicon that defines the grammatical categories of the input which define the words and word order, col. 3, lines 1-5 and 23-27);

wherein each phrase fragment includes one of said attributes, (a phrase can be made up of a noun, adjective and verb, col.7, lines 3-10).

Van De Veen, does not teach:

each rule including a head, phrase fragment, a direction and a condition, wherein each phrase fragment includes one of said attributes;

receiving a scoring function from the user;

generating possible natural language phrases using the grammar rules;

determining an optimal natural language phrase from the possible natural language phrases using the scoring function;

returning said optimal natural language phrase to the user

However, Dale et al. teach each rule including a head, a phrase fragment, a direction and a condition (rules of word formation and rules of sentence formation, rules such as forming verb tense, forming noun plurals. Rules of direction such as,

subject goes before the verb, the subject and verb should agree, page 56. slide 166, and page 20 slides 58-60);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the natural language phrase creator of Dale et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Dale et al. page 1, slide 2.

Van De Veen and Dale et al. do not teach:

receiving a scoring function from the user;

determining an optimal natural language phrase from the possible natural language phrases using the scoring function;

generating possible natural language phrases using the grammar rules; nor returning said optimal natural language phrase to the user

However, Langkilde et al. teach:

receiving a scoring function from the user (a statistical extractor able to select the best sentence from the possibilities, (page 705, col. 1). The examiner reads the term "user" as including the programmer of the system since the term is never fully disclosed within the specification, and since the "scoring function" is described as being "provided in advance (specification page 6, lines 22-23)" necessarily supplied by the programmer; therefore, since the statistical extractor was in place before the system is to be used, it would be necessary for the programmer to have supplied it);

generating possible natural language phrases using the grammar rules (encoding the different possibilities supplied by the lattice structure into different phrases, where the lattice structure is based on the corpus of the system, page 705, col. 1);

determining an optimal natural language phrase from the possible natural language phrases using the scoring function (selecting the leading phrase from the possibilities based on the statistical extractor, page 705, col. 1);

returning said optimal natural language phrase to the user (outputting an English string, fig. 1, page 705).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the natural language phrase creator of Dale et al. and with the statistical extractor of Langkilde et al. to increase the systems ability to create an output for unexpected or incomplete outputs as taught by Langkilde et al. (page 710, col. 1).

As to claim 12, Van De Veen teaches:

receiving a concept comprising attributes and corresponding values of each of said attributes from a user (input that is dependent of the relationships and links between each and also the ambiguities between each, col. 2, lines 55-58);

receiving grammar rules from the user (input language lexicon that defines the grammatical categories of the input which define the words and word order, col. 3, lines 1-5 and 23-27);

wherein each phrase fragment includes one of said attributes, (a phrase can be made up of a noun, adjective and verb, col.7, lines 3-10).

Van De Veen, does not teach:

each rule including a head, phrase fragment, a direction and a condition, wherein

each phrase fragment includes one of said attributes;

receiving a scoring function from the user;

generating possible natural language phrases using the grammar rules;

computing a score for each of the natural language phrases using the scoring function;

returning the highest scoring natural language phrase to the user

However, Dale et al. teach each rule including a head, a phrase fragment, a direction and a condition (rules of word formation and rules of sentence formation, rules such as forming verb tense, forming noun plurals. Rules of direction such as, subject goes before the verb, the subject and verb should agree, page 56. slide 166, and page 20 slides 58-60);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the natural language phrase creator of Dale et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Dale et al. page 1, slide 2.

Van De Veen and Dale et al. do not teach:

receiving a scoring function from the user;

determining an optimal natural language phrase from the possible natural language phrases using the scoring function;

generating possible natural language phrases using the grammar rules; nor returning said optimal natural language phrase to the user

However, Langkilde et al. teach:

receiving a scoring function from the user (a statistical extractor able to select the best sentence from the possibilities, (page 705, col. 1). The examiner reads the term "user" as including the programmer of the system since the term is never fully disclosed within the specification, and since the "scoring function" is described as being "provided in advance (specification page 6, lines 22-23)" it necessarily would be supplied by the programmer; therefore, since the statistical extractor was in place before the system is to be used, it would be necessary for the programmer to have supplied it);

generating possible natural language phrases using the grammar rules (encoding the different possibilities supplied by the lattice structure into different phrases, where the lattice structure is based on the corpus of the system, page 705, col. 1);

computing a score for each of the natural language phrases using the scoring function; (selecting the leading phrase from the possibilities based on the statistical extractor and ranker, (page 705, col. 1). It would be obvious to one of ordinary skill in the art at the time of the invention that since a statistical extractor is used to sort good sentences from bad sentences based on of a form of n-gram frequencies, and a statistical ranker to extract the best path of the lattice for output, scores would be used to rank the paths with in the lattice, were the best path is then outputted as a sentence);



returning said optimal natural language phrase to the user (outputting an English string, fig. 1, page 705).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the natural language phrase creator of Dale et al. and with the statistical extractor of Langkilde et al. to increase the systems ability to create an output for unexpected or incomplete outputs as taught by Langkilde et al. page 710, col. 1).

As to claims 2 and 13, Van De Veen does teach that the head is a word (a noun which is connected to both a adjective and to a transitive verb is a phrase clause, it would have been inherent that since the noun, adjective, verb clause is in English, there would be a leading word in the phrase (head), col. 7, lines 3-5).

As to claims 3 and 14, Van De Veen does teach of a phrase fragment that is a natural language phrase fragment (phrase is made up of noun which is qualified by an adjective and a verb, col. 7, lines 3-5).

As to claims 4 and 15, Van De Veen teaches a direction that indicates the location of the phrase fragment (if the current word is qualifies the proceeding word, that current is word is placed on the left-hand side, if the current word is qualified by the proceeding word, the current word is placed on the right hand side, col. 7, lines 22-28).

As to claims 5 and 16, Van De Veen teaches the condition as a code fragment for restricting use of a rule (search codes to be stored in search space when processing the current word and the argument of the current, the sixth column indicates the previously stored search codes to be removed from the search, col. 9, lines 43-49).

As to claims 6 and 17, Van De Veen teaches each attribute in the optimal natural language phrase is replaced with its corresponding value (the analyzer module searches for the words in the left hand column of Table 1 for the same word and, when this is found, obtains the corresponding meaning shown in the third column of Table 1, assigns unique values to the arguments and inserts that meaning with the values, col. 5, lines 64-67, and col. 6, lines 1-3).

As to claims 7 and 18, Van De Veen and Dale et al. do not teach the optimal natural language phrase is a highest scoring natural language phrase that is consistent with the grammar rules.

However, Langkilde et al. teach selecting the highest-ranking path from the word lattice for output word the word lattice is based on the grammar and lexicon, (page 705, col. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the natural language phrase creator of Dale et al. and with the statistical extractor of

Langkilde et al. to increase the systems ability to create an output for unexpected or incomplete outputs as taught by Langkilde et al. (page 710, col. 1).

As to claims 9 and 20, Van De Veen does not teach the attributes are variables.

However, Dale et al. teach that the attributes are variables (grammar supplies a set of choices for realization which are made on the basis of the input sentence plan, page 58, slide 172)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the input scoring capabilities taught by Okajima, with grammar and phrase definitions of Dale et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Dale et al. page 1, slide 2.

As to claim 10, Van De Veen teaches the direction indicates that the location of the phrase fragment is right of the head (if the current word is qualified by the preceding word, the selected value of the meaning of the current word is placed upon the right-hand side of the equation, as for the example "camera on," col. 7 lines 26-31, and col. 8 lines 1-3).

As to claim 11, Van De Veen teaches the direction indicates that the location of the phrase fragment is left of the head, (if the current word qualifies the preceding word, the selected value of the meaning of the current word is placed on the left-hand side of

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the equation, as per the example, "the camera," col. 7, lines-22-27, and col. 8, lines 1-3).

4. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van De Veen in view of Dale et al. and Langkilde et al. as applied to claims 1 and 12 above, and further in view of Asahara et al., (17th conference on computational linguistics).

Van De Veen, and Dale et al. do not teach that the scoring function is a probability of P of a phrase of length N based on the probability P of a word  $w_i$  conditioned on the previous words,  $w_{i-1}$  and  $w_{i-2}$ , the scoring function comprises the equation:

$$\prod_{i=1}^N P(w_i | w_{i-1}, w_{i-2})$$

However, Asahara et al. teach using trigrams and include the scoring function:

$$P(T) = \prod_{i=1}^n P(t_i | t_{i-2}, t_{i-1})$$

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output systems of Van De Veen, the natural language generation of Dale et al. and the statistical extractor of Langkilde et al. with the scoring function of Asahara et al. to improve the part-of-speech tagging natural language models, as taught by Asahara et al. (page 21, col. 1).

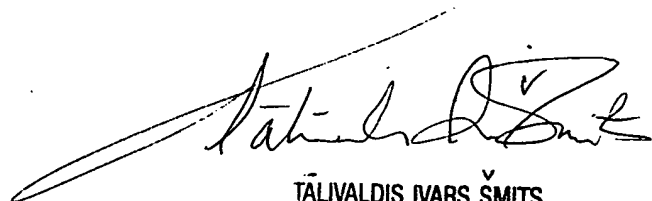
**Conclusion**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas E Shortledge whose telephone number is (703)605-1199. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on 703-306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TS  
7/19/04



TĀLIVALDIS IVARS ŠMITS  
PRIMARY EXAMINER